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EXAMINER	
PALABRICA, RICARDO J	
ART UNIT	**PAPER NUMBER**
3663	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/753,355	JESTICE, AARON L.	
	Examiner	Art Unit	
	Rick Palabrica	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-38 and 40-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-38 and 40-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/19/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's 2/8/07 Amendment, which elected without traverse Species B (as shown in Fig. 3), species C (explosive), subspecies of TNT, and subspecies of food as confounder, is acknowledged. Applicant has canceled claims1-22, and 39, amended claims 24, 40, 43 and 44. Claims 23-38 and 40-47, which read on the elected invention, are examined in this Office action.

Specification

2. The incorporation of essential material in the specification by reference to an unpublished U.S. application, foreign application or patent, or to a publication is improper. See, for example, see paragraph 0027 of the specification. Applicant is required to amend the disclosure to include the material incorporated by reference, if the material is relied upon to overcome any objection, rejection, or other requirement imposed by the Office. The amendment must be accompanied by a statement executed by the applicant, or a practitioner representing the applicant, stating that the material being inserted is the material previously incorporated by reference and that the amendment contains no new matter. 37 CFR 1.57(f).

Drawings

3. Color photographs and color drawings are not accepted unless a petition filed under 37 CFR 1.84(a)(2) is granted. Any such petition must be accompanied by the appropriate fee set forth in 37 CFR 1.17(h), three sets of color drawings or color photographs, as appropriate, and, unless already present, an amendment to include the

following language as the first paragraph of the brief description of the drawings section of the specification:

> The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

Color photographs will be accepted if the conditions for accepting color drawings and black and white photographs have been satisfied. See 37 CFR 1.84(b)(2).

Figs. 4, 5, and 6 appear to be faint reproductions of color photographs.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 23-38 and 40-47 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 23 recites step 5 as, "analyzing the gamma counts associated with the explosives or controlled substances in the object". Underlining provided. There is neither an adequate description nor enabling disclosure as to how and in what manner

said gamma counts can be analyzed at this step of the claimed process, when it has not been definitively established that an object contains any explosives or controlled substances. Note that it is only in subsequent step 6 where such presence of said materials of interest is determined.

Claim 24 recites step 1 as, "detecting the back scattered gamma rays emitted by all substances contained within the object in response to the irradiation." There is no support in the specification for such species of gamma rays being detected in the claimed process.

5. Claim 24 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The steps of: a) irradiating the object with neutron particles, and b) analysis of the signatures provided by the signal processor critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

The detection of gamma rays in step 1) of the claim cannot be implemented without the irradiation step a) above. The use of the maximal rejection hierarchy classifier requires the prior step b) above (see paragraph 0033 of the specification).

6. Claims 23-38 and 40-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 recites step 6 as, "determining whether an explosive or controlled substance is present in the object when the relative atomic percentages of elements comprising the controlled substances are substantially similar to the relative atomic percentages of elements associated with known explosives and controlled substance." Underlining provided. As presently set forth, the limitation starting with the term, "when", indicates that determination of the presence of the materials of interest is performed conditionally, i.e., only when the stated condition is fulfilled.

Claim 23 and its dependent claims are vague, indefinite and incomplete, and its metes and bounds cannot be determined. Claim 23 is inconsistent with the specification because the claimed process makes a determination whether explosives or controlled substances are present in an object whenever it is subjected to screening, regardless of the result of the interrogation from said screening.

Claim 24 recites the limitation "the irradiation" in lines 4 and 5. There is insufficient antecedent basis for this limitation in the claim.

Claims 28 and 31 recite pulsing the neutron sources, "sequentially." The claims are vague, indefinite and incomplete, and its metes and bounds cannot be determined because no criterion is provided for "sequential". For example, what is the order of pulsing of the plurality of neutron sources, what is the interval between pulsing of the sources, is this interval fixed or variable?

Claim 33 recites the phrase, "low intensity neutrons". The term "low", which is a relative term, renders the claim indefinite. The term is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one

of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 34 recites the phrase, "close proximity", which is a relative term, renders the claim indefinite. The term is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 45 is vague, indefinite and incomplete and its metes and bounds cannot be determined. The claim lacks one gamma ray energy value.

7. Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: steps a) and b), which are identified in section 5 above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> **A person shall be entitled to a patent unless –**
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 23, 33, 35-38, 40-43, and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by either one of Gozani et al. (U.S. 5,114,662) or Allyson et al. (EP 033634), who each disclose a method of detecting explosives.

Gozani et al.

As to claim 23, 41-43, and 45, Gozani et al. teach an apparatus and a method for detecting explosives by transporting an object through a cavity with multiple turns (e.g., see Fig. 2), irradiating the object with neutrons from plurality of neutron sources (32, 34), detecting the prompt gamma rays with a plurality of gamma ray detectors (see detectors 36, 38, 40 in Fig. 3), and analyzing the gamma counts from the object to determine the presence of explosives. Gozani et al.'s method includes detection of nitrogen and/or other elements and compares them with other items that typically contain, e.g., nitrogen. Any unusual concentration and distribution of nitrogen bearing material is deemed to likely be an explosive material (see paragraph bridging cols. 9 and 10). Such determination of unusual nitrogen concentration relative to the other elements in a sample, for example, is a measure of relative percentages of elements in the sample.

As to claim 33, applicant has not defined the term, "low intensity neutron sources", and absent such definition, the examiner interprets the term broadly and reads it on the neutron sources in Gozani et al.

As to claim 35, applicant has not defined the term, "close proximity", and absent such definition, the examiner interprets the term broadly and reads it on the configuration of the neutron sources in Gozani et al. (see Fig. 3)

As to claims 36 and 37, neutron sources 26 and 28 are disposed on two sides of the array and irradiated predetermined areas of the object (see Fig. 3).

As to claims 38 and 40, see Fig. 3.

As to claim 45, the gamma ray energies recited in the claim are inherent properties of the explosives detected by the method of Gozani et al., and therefore the claim limitation is met.

Allyson et al.

As to claim 23, 41-43, and 45, Allyson et al. teach an apparatus and a method for detecting explosives by transporting an object through a cavity with multiple turns (e.g., see Fig. 2), irradiating the object with neutrons from plurality of neutron sources (see 22, 43 in Fig. 4), detecting the prompt gamma rays with a plurality of gamma ray detectors (see detectors 44, 21 in Fig. 4), and analyzing the gamma counts from the object to determine the presence of explosives. Allyson et al.'s method includes detection of nitrogen and compares them with other items that typically contain, e.g., nitrogen. Any unusually high concentration and distribution of nitrogen level within the object is deemed to likely be an explosive material (see col. 3, lines 41+, and col. 10, lines 14+). Such determination of unusual nitrogen concentration relative to the other elements in a sample, for example, is a measure of relative percentages of elements in the sample.

As to claim 33, applicant has not defined the term, "low intensity neutron sources", and absent such definition, the examiner interprets the term broadly and reads it on the neutron sources in Allyson et al.

As to claim 35, applicant has not defined the term, "close proximity", and absent such definition, the examiner interprets the term broadly and reads it on the configuration of the neutron sources in Allyson et al. (see Fig. 4)

As to claims 36 and 37, neutron sources 22 and 43 are disposed on two sides of the array and irradiated predetermined areas of the object (see Fig. 4).

As to claims 38 and 40, see Fig. 4 and col. 9, lines 46+.

As to claim 45, the gamma ray energies recited in the claim are inherent properties of the explosives detected by the method of Allyson et al., and therefore the claim limitation is met.

9. Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by any one Gozani et al. or Tumer (U.S. 5,557, 108) or Allyson et al.

The objects irradiated by the neutron source 10 in Gozani et al. inherently produce back-scattered gamma rays that are detected by their gamma detectors. Applicant's claim language reads on Gozani et al., as follows: a) "isolating common eigen value signatures" reads on the results of the characterization of the suspected chemical element in the object detected at the first inspection station; b) "maximal rejection hierarchy classifier" recites on the testing at the second inspection station where the information obtained from the first inspection station is confirmed or disproved (see col. 1, lines 27+). Such confirmatory testing in the second inspection station obviates the interference from a confounding substance.

Turner discloses a method for detecting explosives using a neutron source 703 and detecting the back scatter gamma rays by an array of detectors 704(see Fig. 7 and col. 7, line 14+). Applicant's claim language reads on Turner, as follows: a) "isolating common eigen value signatures" reads on the results of comparing the signature of

every object within the container with the signature of known explosives (see col. 8, lines 14+); b) "maximal rejection hierarchy classifier" recites on superposition of the data in a) above with x-ray imagery to obtain confirmation of explosives detected in a) (see col. 8, lines 23+). Such confirmatory testing using x-ray imagery obviates the interference from a confounding substance.

Allyson et al. has been discussed above. Applicant's claim language reads on Allyson et al., as follows (see Fig. 6): a) "isolating common eigen value signatures" reads on the common signature of high nitrogen concentration in any two windows, e.g., A2 and B2; b) "maximal rejection hierarchy classifier" recites on the confirmation of the finding in a) above by analyzing the readings from the other windows (e.g., the combination of A1, B1, C1, C2, C3, B3, A3 and A2) that increases the detection efficiency (see col. 8, lines 48+). Such confirmatory analysis in b) obviates the interference from a confounding substance.

10. Claims 27-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Allyson et al., who disclose pulsing neutron sources simultaneously and sequentially (see Fig. 4 and col. 5, lines 46+). The claims do not preclude sequential pulsing even when no presence of an explosive is suspected, as in Allyson et al.'s case.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 23, 25, 27-31, 33-38, 40-43, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Grenier et al. (U.S. 5,080,856) in view of Allyson et al. Grenier et al. disclose the applicant's claim limitations except for the plurality of neutron sources.

As to claim 23, Grenier et al. teach an apparatus and a method for detecting explosives by transporting an object through a cavity with multiple turns (see Fig. 1 and means 40, 42, 54), irradiating the object with a neutron source 10, detecting the prompt gamma rays with a plurality of gamma ray detectors (see detectors 12, 14, 16, 18), and analyzing the gamma counts from the object to determine the presence of explosives. Grenier et al.'s method includes detection of nitrogen (N), oxygen (O) and carbon (C), determines the ratios of N/O and C/O and compares them with corresponding ratios of known explosives (see col. 6, lines 61+). The irradiation of the object by neutron source 10 in Grenier et al. inherently generates some prompt gamma rays that are detected by their gamma ray detectors.

Allyson teaches an explosive detection method that uses of a plurality of neutron sources (instead of a single source) to increase the efficiency and effectiveness of detection (see page 2, paragraph bridging cols. 1 and 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process, as disclosed by Grenier et al., by the teaching of Allyson, to use a plurality of neutron sources, to gain the advantages

thereof (i.e., increased detection efficiency), because such modification is no more than the use of a well known expedient within the nuclear art, and the substitution of one source configuration by another well known configuration.

As to claim 25, Grenier et al. teaches the use of a hydrogen containing material for the wall surrounding the cavity (see col. 3, lines 58+). Water is an example of such material and is well known as a good neutron moderator.

As to claims 27-31, the modified Grenier et al. pulses the neutron sources simultaneously (e.g., at inspection station I) and sequentially (e.g., at inspection station V or VI) after detection of the presence of an explosive at inspection station I (see discussion of method of operation at col. 5, line 36 to col. 6, line 69).

As to claim 33, applicant has not defined the term, "low intensity neutron sources", and absent such definition, the examiner interprets the term broadly and reads it on the neutron sources in the modified Grenier et al.

As to claim 35, applicant has not defined the term, "close proximity", and absent such definition, the examiner interprets the term broadly and reads it on the configuration of the neutron sources in the modified Grenier et al. (e.g., see Fig. 3).

As to claims 36 and 37, based on the teaching in Allyson, an equal number of neutron sources disposed on two sides of an array would be optimum for the modified Grenier et al. because this configuration provides good source strength for all inspection stations (I-VI) in Fig. 1.

As to claims 38 and 40, see Fig. 1.

As to claim 45, the gamma ray energies recited in the claim are inherent properties of the explosives detected by the modified Grenier et al., and therefore the claim limitation is met.

12. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Grenier et al. and Allyson et al., who teach use of 14.7 MeV neutrons (see col. 3, liens 18+ in Grenier et al.).

As to the claimed energy density, this is a matter of design choice and/or optimization within prior art conditions or through routine experimentation (see MPEP 2144.05 II.A). The required energy density is dictated by the particular design requirements for the facility and the application of the detection system, including the size and configuration of the objects to be tested, the container of the objects, the cavity, etc. Alternatively, the energy density adopted for a particular application requires the proper balancing of competing factors, e.g., a high density would allow testing of a wider range of objects but would cost more to produce.

13. Claims 32, 34 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of Gozani et al. or the combination of Grenier et al. and Allyson et al. or Allyson et al.

As to claims 32 and 34, a similar argument as that given in section 10 above applies. See also the cost/benefit discussion in Allyson et al. regarding the number of neutron sources and gamma ray detectors (see paragraph bridging cols. 6 and 7).

As to claim 44, TNT is a well-known explosive that can be detected by the method in either one of the two references above. See col. 3, lines 43+ in Gozani et al.

14. Claims 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one Gozani et al. or the combination of Grenier et al. and Allyson, or Allyson et al., in view of Vourvopoulos et al. (U.S. 6,563,898).

Any one Gozani et al. or the combination of Grenier et al. and Allyson or Allyson et al. disclose the applicant's claim limitations except for determination of the presence of a food confounder.

Vourvopoulos et al. teach a method of detecting explosives using a neutron source similar to the primary references (see Abstract). They further teach identifying a confounder such as coffee or sugar by determining the carbon to oxygen ratio in the suspected object (see col. 8, lines 30+).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process, as disclosed by any one of Gozani et al. or the combination of Grenier et al. and Allyson, or Allyson et al., by the teaching of Vourvopoulos et al., to include a determination of the presence of a food confounder, to gain the advantages thereof (i.e., provide higher detection accuracy), because such modification is no more than the use of a well known expedient within the nuclear art.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References E-L further illustrate prior art.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RJP
March 8, 2007

RPalabrica
RICARDO J. PALABRICA
PRIMARY EXAMINER